

IN THE CLAIMS:

Please CANCEL claims 3, 4, 12-14, 16 and 17 without prejudice to or disclaimer to recited subject matter.

Please AMEND claims 1, 5, 6, 19, 22, 29 and 31, as follows. For the Examiner's convenience, all pending claims are reproduced below:

01 1. (Currently Amended) A scan type exposure apparatus wherein a pattern of an original is lithographically transferred to a substrate sequentially while the original and the substrate are scanningly moved relative to exposure light, said apparatus comprising:

a photodetector disposed in an illumination optical system and at a position optically conjugate with the original, for detecting a quantity of light illuminating the original;

storing means for storing correction information with respect to the output of said photodetector, in relation to different positions of the original to be illuminated with the exposure light; and

a correction device for receiving correction information stored in said storage means and correcting, in the lithographic pattern transfer, the output of said photodetector by use of the stored correction information, while excluding influence of a reflection light component.

2. (Previously Amended) An apparatus according to Claim 1, wherein the correction information concerns information corresponding to a light quantity of reflection light at each of different positions of the original illuminated with the exposure light.

3-4. (Cancelled)

5. (Currently Amended) A scan type exposure apparatus wherein a pattern of an original is lithographically transferred to a substrate sequentially while the original and the substrate are scanningly moved relative to exposure light, said apparatus comprising:

a first photodetector, disposed at a position optically conjugate with the original, for detecting information regarding the original and for producing an output;

a second photodetector for detecting reflection light from the original and for producing an output;

storing means for storing correction information with respect to the output of said first photodetector in relation to different positions of the original, on the basis of the outputs of said first and second photodetectors; and

a correction device for receiving the correction information stored in said storing means and for correcting, in the lithographic pattern transfer, the output of said first photodetector by use of the correction information, while excluding influence of a reflection light component.

6. (Currently Amended) A scan type exposure apparatus wherein a pattern of an original is lithographically transferred to a substrate sequentially while the original and the substrate are scanningly moved relative to exposure light, said apparatus comprising:

an illumination optical system for illuminating an original with exposure light output from a light source;

a projection optical system for projecting a pattern of the original, illuminated by the illumination optical system, onto a substrate;

a photodetector disposed in said illumination optical system and at a position optically conjugate with the original, for detecting a quantity of light illuminating the original;

control means for controlling the exposure light output from the light source on the basis of the output of the photodetector; and

correcting means for reducing an influence of reflection light from the original, on the basis of the output of the photodetector as the original is illuminated by the illumination optical system, while excluding influence of a reflection light component.

7. (Previously Amended) An apparatus according to Claim 6, wherein said correcting means operates to reduce or remove the influence of the reflection light, while referring to the output of said photodetector in a state in which the original is illuminated by said illumination optical system and in which there is no reflection light coming from the original and directed back to said photodetector.

8. (Previously Amended) An apparatus according to Claim 6, wherein said correcting means includes reflection light detecting means for detecting reflection light from the original, as illuminated by said illumination optical system, and being directed back to said illumination

optical system, and wherein said correcting means operates to reduce or remove the influence of the reflection light, while referring to a result of the detection by said reflection light detecting means.

9. (Previously Cancelled)

10. (Previously Amended) An apparatus according to Claim 7, wherein said light source comprises a discharge lamp, said correcting means operates so that (i) outputs of said photodetector in relation to each movement position are obtained beforehand while an applied electric power to said discharge lamp is kept constant and while the scan motion is performed at a speed lower than an ordinary scan speed, (ii) during the procedure in (i), the output of said photodetector in a state in which there is no light coming from the original and directed to said photodetector is obtained, (iii) in actual exposure of the substrate, at a start of the scan motion, an output of said photodetector in a state in which there is no reflection light coming from the original and directed back to said photodetector is obtained, and (iv) at each of the movement positions in the scan motion, any influence of reflection light is removed or reduced on the basis of the output in (iv) and the outputs having been obtained beforehand, and said control means controls, at each of the movement positions in the scan motion, the exposure light output from said light source on the basis of an output of said photodetector with the influence of reflection light being removed or reduced.

11. (Previously Amended) An apparatus according to Claim 8, wherein said light source comprises a discharge lamp, said correcting means operates so that (i) outputs of said photodetector and outputs of said reflection light detecting means in relation to each movement position are obtained beforehand while an applied electric power to said discharge lamp is kept constant and while the scan motion is performed at a speed lower than an ordinary scan speed, and (ii) in actual exposure of the substrate, at each of the movement positions in the scan motion, any influence of reflection light is removed or reduced on the basis of the output of said photodetector and a result of detection by said reflection light detecting means, and said control means controls, at each of the movement positions in the scan motion, the output of said light source on the basis of an output of said photodetector with the influence of reflection light being removed or reduced.

12-14. (Cancelled)

15. (Previously Amended) An apparatus according to Claim 2, wherein the correction information includes information corresponding to the light quantity of reflection light from the substrate.

16-17. (Cancelled)

18. (Previously Added) An apparatus according to Claim 5, wherein the correction information includes information corresponding to the light quantity of reflection light from the substrate.

19. (Currently Amended) A scan type exposure apparatus wherein a pattern of an original is lithographically transferred to a substrate sequentially while the original and the substrate are scanningly moved relative to exposure light, said apparatus comprising:

a photodetector disposed in an illumination optical system, for detecting a quantity of light illuminating the original;

storing means for storing correction information with respect to an output of said photodetector, in relation to different positions of the original to be illuminated with the exposure light; and

a correction device for receiving information stored in said storage means and correcting, in the lithographic pattern transfer, the output of said photodetector by use of the stored information, while excluding influence of a reflection light component.

20. (Previously Added) An apparatus according to Claim 19, wherein the correction information concerns information corresponding to a light quantity of reflection light at each of different positions of the original illuminated with the exposure light.

21. (Previously Added) An apparatus according to Claim 20, wherein the correction information includes information corresponding to the light quantity of reflection light from the substrate.

22. (Currently Amended) An exposure apparatus, comprising:

an illumination optical system for illuminating an original with exposure light output from a light source;

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a projection optical system for projecting a pattern of the original, illuminated by the illumination optical system, onto a substrate;

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a photodetector disposed in said illumination optical system, for detecting a quantity of light illuminating the original;

control means for controlling the exposure light output from the light source on the basis of the output of the photodetector; and

correcting means for reducing an influence of reflection light from the original, on the basis of the output the photodetector as the original is illuminated by the illumination optical system, while excluding influence of a reflection light component.

23. (Previously Added) An apparatus according to Claim 22, wherein said correcting means operates to reduce or remove the influence of the reflection light, while referring to the output of said photodetector in a state in which the original is illuminated by said illumination

optical system and in which there is no reflection light coming from the original and directed back to said photodetector.

24. (Previously Added) An apparatus according to Claim 22, wherein said correcting means includes reflection light detecting means for detecting reflection light from the original, as illuminated by said illumination optical system, and being directed back to said illumination optical system, and wherein said correcting means operates to reduce or remove the influence of the reflection light, while referring to a result of the detection by said reflection light detecting means.

25. (Previously Added) An apparatus according to Claim 22, wherein said exposure apparatus is a scan type exposure apparatus in which exposure is performed while the original and the substrate are scanningly moved relative to the exposure light from said illumination optical system and relative to said projection optical system, wherein said correcting means is operable to reduce or remove any influence of the reflection light at each movement position in the scan motion, and said control means is operable to control the exposure light output from said light source on the basis of the output of said photodetector, with the influence of the reflection light at each of the movement positions in the scan motion being reduced or removed.

26. (Previously Added) An apparatus according to Claim 23, wherein said exposure apparatus is a scan type exposure apparatus in which exposure is performed while the original



and the substrate are scanningly moved relative to the exposure light from said illumination optical system and relative to said projection optical system, wherein said light source comprises a discharge lamp, said correcting means operates so that (i) outputs of said photodetector in relation to each movement position are obtained beforehand while an applied electric power to said discharge lamp is kept constant and while the scan motion is performed at a speed lower than an ordinary scan speed, (ii) during the procedure in (i), the output of said photodetector in a state in which there is no light coming from the original and directed to said photodetector is obtained, (iii) in actual exposure of the substrate, at a start of the scan motion, an output of said photodetector in a state in which there is no reflection light coming from the original and directed back to said photodetector is obtained, and (iv) at each of the movement positions in the scan motion, any influence of reflection light is removed or reduced on the basis of the output in (iv) and the outputs having been obtained beforehand, and said control means controls, at each of the movement positions in the scan motion, the exposure light output from said light source on the basis of an output of said photodetector with the influence of reflection light being removed or reduced.

27. (Previously Added) An apparatus according to Claim 24, wherein said exposure apparatus is a scan type exposure apparatus in which exposure is performed while the original and the substrate are scanningly moved relative to the exposure light from said illumination optical system and relative to said projection optical system, wherein said light source comprises a discharge lamp, said correcting means operates so that (i) outputs of said photodetector and

outputs of said reflection light detecting means in relation to each movement position are obtained beforehand while an applied electric power to said discharge lamp is kept constant and while the scan motion is performed at a speed lower than an ordinary scan speed, and (ii) in actual exposure of the substrate, at each of the movement positions in the scan motion, any influence of reflection light is removed or reduced on the basis of the output of said photodetector and a result of detection by said reflection light detecting means, and said control means controls, at each of the movement positions in the scan motion, the output of said light source on the basis of an output of said photodetector with the influence of reflection light being removed or reduced.

28. (Previously Added) An apparatus according to Claim 21, wherein the correction information includes information corresponding to the light quantity of reflection light from the substrate.

29. (Currently Amended) A scan type exposure apparatus, comprising:  
an illumination optical system for illuminating an original, in a predetermined shape, with light from a light source;  
a projection optical system for projecting a pattern of the original, illuminated by said illumination optical system, onto a substrate;

a photodetector disposed inside said illumination optical system, for detecting a quantity of illumination light in said illumination optical system and for providing an output of illumination light quantity information in relation to each operative position in scan motion;

first control means for controlling output of the light source in accordance with each output of said photodetector;

storing means for reducing or removing, in relation to different positions on the original illuminated in the predetermined shape, a component of reflection light from the original included in the photodetector output, and for holding correction information for calculation of an illumination light quantity solely from the light source;

calculating means for receiving correction information held by said storing means and for receiving illumination light quantity information from said photodetector in each operative position in the scan motion, to calculate, in accordance with the correction information, information on illumination light quantity solely from the light source, without being influenced by the reflection light ~~component and;~~ component; and

second control means for receiving the information of illumination light quantity solely from the light source, calculated by said calculating means, to control output of exposure light from the light source so that, at each operative position in the scan motion, the illumination light quantity solely from the light source is kept at a predetermined value.

30. (Previously Added) An apparatus according to Claim 29, wherein, in a state in which, before an actual exposure operation, the light source is not controlled on the basis of the

photodetector output, said storing means receives information of illumination light quantity in said illumination optical system from said photodetector, at each operative position in the scan motion, to produce correction information in relation to each operative position of the scan motion.

31. (Currently Amended) A scan type exposure apparatus, comprising:

an illumination optical system for illuminating an original, in a predetermined shape, with light from a light source;

a projection optical system for projecting a pattern of the original, illuminated by said illumination optical system, onto a substrate;

a first photodetector disposed inside said illumination optical system, for detecting a quantity of illumination light in said illumination optical system and providing an output of illumination light quantity information in relation to each operative position in scan motion;

a second photodetector for detecting a quantity of reflection light from the original and providing an output of information of reflection light quantity from the original at each operative position in the scan motion;

calculating means for calculating an illumination light quantity solely from the light source, on the basis of the illumination light quantity information from said first photodetector and the reflection light quantity information from said second photodetector;

correction means for receiving an output of said calculating means and receiving, at each operative position of the scan motion, illumination light quantity information from said

first photodetector and reflection light quantity information from said second photodetector, to calculate information of illumination light quantity solely from the light source while excluding influence of a reflection light component on the basis of the output; and

control means for receiving the information of illumination light quantity solely from the light source, with the influence of reflection light component being excluded, on the basis of an output of said correction means, and to control output of exposure light from the light source so that, at each operative position in the scan motion, the illumination light quantity solely from the light source in is kept at a predetermined value.

32. (Previously Added) An apparatus according to Claim 31, wherein, in a state in which, before an actual exposure operation, the light source is not controlled on the basis of outputs of said first and second photodetectors, said calculating means receives information of illumination light quantity in said illumination optical system and information of reflection light quantity from said first and second photodetectors, at each operative position in the scan motion, to calculate a ratio between an amount of change in the illumination light quantity information and an amount of change in reflection light quantity information, and wherein said calculating means calculates, in an actual exposure operation, the illumination light quantity solely from the light source on the basis of the calculated ratio.